Embedded Alley Engineering
Expertise and Services

Market expertise

Industrial
Man-Machine Interface (UI + industrial computer to control multiple devices)
Data monitoring (collecting information from sensors and forwarding/reporting via network, GUI, web interfaces)
Data acquisition (collect and accumulate data from various sources/buses)
Flight recording (Marine/Navy, cars)
Industrial buses: CAN, rs485, PROFIBUS, Modbus
Infortainment platforms
Telecom
Expert in the key technologies of availability, scalability, manageability, and serviceability for telecom and networking
Hardware bring-up and drivers
Network protocols (implementation, optimization)
Network management
Linux on the data plane
Traffic processing: optimizing bridge stack, NAT or routing
IPMI and link redundancy
Drivers/kernels: bonding, redundancy, crash, kexec and fastboot, SAF
ATCA, SAN, IPMI, ATM, TCP/IP, IPv4/6, IPSec, routing (OSPF, RIP, BGP), NAT, VoIP, SCTP, SCSI, SAF
Consumer electronics
Multimedia platforms: PDAs, audio/video players, MIDs, set top boxes, digital TV
Experts in audio drivers and codecs, 3D (OpenGL)

Medicine
Firmware for medical equipment (control motors and sensors)
Board support packages and GUI for medical devices

Military
Board support packages for military devices

Graphic stacks for maps/location visualizations and simulation

Decades of experience, committed to customer needs
Embedded Alley enables its customers to deliver winning products to their markets by bridging the gap between open source and proprietary software, providing Linux, middleware and know how to companies delivering a multitude of mobile and embedded devices. Headquartered in San Jose, California, with operations worldwide, Embedded Alley has built a distributed engineering company with impeccable reputation in the industry.

With a continuing commitment to customer needs, not just the technology, Embedded Alley works through every stage of the product lifecycle, delivering the highest level of Linux engineering expertise while striving to be both professional and approachable, and a pleasure to do business with.

Embedded Alley enables the full freedom of open source with an up-to-date knowledge of the community, and how to apply available software components to your product. With a collaborative spirit, Embedded Alley works closely with customers on systems engineering, production quality, testing, performance and reliability, with tools and practices that focus not just on early development but through production and beyond.

Management

With over a century of collective experience in the high tech industry and entrepreneurial engagements around the world, and particular expertise in embedded Linux, the Embedded Alley management team has been instrumental in defining product offerings, shaping business models and building market strategies for embedded systems. Team members have held management roles in product and business development at IBM, Motorola Computer Group, MontaVista Software and the Microtec division of Mentor Graphics.

Clockwise from upper left: Pete Popov, CEO; Paul Staudacher, President; Matt Porter, Chief Architect; Dan Malek, CTO; Matthew Locke, COO; Ken Keller, Vice President of Engineering

An overview of Embedded Alley offerings

Application modeling for system design
Application modeling assists in application design, while validating hardware selection. Embedded Alley builds modeling processes to illuminate the read and write behavior of the entire software stack, including application updates, data logging, user preferences and data files, as well as top-to-bottom system performance, helping OEMs determine the best hardware and software choices for flash and other memory components.

The Embedded Alley Development System
Embedded Alley offers a set of integrated open source software components built into an easy-to-use development environment for board-level port, driver and application development. The Embedded Alley Development System includes cross compilers, a choice of C libraries (glibc or uClibc), debuggers, prepared file system images, and product-specific supporting libraries.

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Embedded Alley Engineering Expertise and Services

Samples of custom projects

OS migration
- Windows to Linux (including adaptation to specific libraries)
- VxWorks to Linux (including optimization for a general-purpose OS), BSP/drivers work, and middleware
- Stacks migration (e.g., MFC to QT), virtualization (coexisting, multiple instances of OSs)

System analysis
- Analysis of bottlenecks, performance issues, and optimizations
- Optimization of data processing for better throughput
- System redesign to achieve better performance
- Optimization of graphics stacks for better GUI responsiveness and multimedia performance
- Linux-specific optimizations to customize Linux from general-purpose OS to dedicated OS

Hardware testing
- Early bring-up, software support for hardware testing, bootloader bring-ups
- Dedicated tests to troubleshoot the hardware
- Tests for manufacturing facility for production stage device testing

Power Management
The Embedded Alley power management solution provides customers with the necessary technology, documentation and training to build products with “best in class” battery life. Leveraging the latest power saving techniques and Open Source software technology with Embedded Alley optimizations and enhancements, the solution delivers an aggressive use-case driven architecture that balances power consumption with performance.

Design and Development Services
Embedded Alley has assembled open source software, industry experience and its own technology so customers can quickly build stable, high-performing products. The depth of the engineering team’s expertise runs the gamut of embedded software requirements:

Hardware Bring-up and Board Support Packages
- Devices ranging from small 8-bit microcontrollers and dedicated SOC up to multi-blade, multi-core 32/64bit systems
- Architectures: PowerPC, ARM, x86, MIPS, 8-bit (ATMega, MC51), 32bit (SuperSH, Xtensa, Sparc)
- Storage devices and filesystems from small block devices (like flash) to SCSI systems

Drivers
- Network drivers ranging from Ethernet and CAN up to complex ATM, plus wireless networks
- Bus drivers: PCI (various generations), USB, low level buses (CAN, I2C, SPI, RS482)
- Multimedia drivers: audio, video, codecs, hardware acceleration, displays, TV, cameras, encoders/decoders/codecs

Multimedia using open source technologies, integrated with hardware acceleration. 3D/OpenGL; Audio/Video hardware offload; Linux ALSA; Video4Linux; STB Cryptographic Processing; HD Video (up/down convert); Trick Play Management; Input/Output; HDMI; S/PDIF; Analog Conversion; Satellite Tuning/Transport; Cable/NTSC/ATSC

Software Updates: Changes and updates captured and documented in tight integration with your source control throughout the product lifecycle

Turnkey product development: Top to bottom product development developed from market requirements

Technology development for customer-specific technology not available from open source or a third party

Application development in Unix, Linux, C++, Java, Eclipse, Scripting, X Windows

Firmware development: No-OS environment, straight code-to-hardware. Firmware for telecom (hardware-optimized implementation of network protocols, e.g., IPSec), industrial (control of sensors and motors, information gathering), medicine (sensors and motors). Hardware architectures: 8-bit, custom (optimized) 32bit processors

Operating system bring-up and porting: Experts in Linux with strong knowledge of VxWorks, Windows CE, QNX, RTEMS, and experience with LynxOS, BSDs, L4, Solaris, pSOS, custom OSs

Bootloaders: Experts in u-boot with strong knowledge of redboot, yamon, Windows CE and VxWorks bootloaders, and experience with custom bootloaders and many hardware-specific configurations

Training courses in Embedded Linux development
- Embedded Linux Introduction
- Embedded Linux Device Driver Development
- Custom Training
- Available as On-Site Training